APPENDIX 13-3

DESIGN REFINEMENTS TECHNICAL MEMORANDUM

BLACK & VEATCH

TECHNICAL MEMORANDUM

South Florida Water Management District
EAA Reservoir A-1
Work Order No. 10

B&V Project 141731
B&V File:
First Issue: July 13, 2005
Last Updated: July 22, 2005

Design Refinements Summary Technical Memorandum

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To: Distribution

From: Tom Cummings. Jim Touslee, Denton Voss

1. INTRODUCTION

In October 2003, South Florida Water Management District (District) decided to pursue a "Dual Track" for the Everglades Agricultural Area (EAA) Reservoir project. While the multi-agency Project Delivery Team, lead by the Corps of Engineers, continues to develop the Project Implementation Report, the District is proceeding with the design of a reservoir (designated EAA Reservoir A-1 Project) located on land acquired through the Talisman exchange in the Everglades Agricultural Area.

The purpose of the Project as defined in the CERP is to capture EAA Basin runoff and releases from Lake Okeechobee. The facilities will be designed to improve the timing of environmental water supply deliveries to STA 3/4 (Storm Water Treatment Area 3/4) and the WCAs (Wetland Conservation Areas), reduce Lake Okeechobee regulatory releases to the estuaries, meet agricultural irrigation demands, and increase flood protection within the EAA.

This Design Refinements Summary Technical Memorandum under WO10 summarizes potential refinements to the District's November 2004 Major Pumping Station Design Guidelines document based on interviews held with Operations personnel from existing facilities G-370 and G-310.

2. OBJECTIVES

The objectives of this Technical Memorandum are to:

- Summarize comments offered by Operations personnel related to potential refinements to the design of the new pumping station resulting from operational experience at the G-370 and G-310 pumping facilities. The comments were offered during a site visit to both existing facilities on June 6, 2005
- Recommend potential design refinements to the Standard Design Guidelines document for consideration by the District and the design team

3. COMMENTS FROM OPERATIONS STAFF

All comments obtained during the site visits were recorded in Meeting Notes issued on June 8, 2005 under the title "Reservoir A-1 Pumping Station BODR Coordination meeting and site visits."

Following is a list of design improvement comments obtained during the site visits:

1. Consideration should be given to the addition of a maintenance shop on the engine level floor as provided for G-310
2. The control room could be located across from the break room as provided for at G310 instead of above the break room as provided for at G-370
3. Provide stairs to the lower level accessible from inside the building
4. Provide flat bed truck access to each pump and engine; and the depressed truck entrance at the loading dock provided in G-370 is not used very much
5. Locate the helicopter pad close to the building so a vehicle is not required to move people from the pad to the building
6. Maintenance area should include workbench, part storage, tool storage, access to work room
7. Maintenance area located on lower level without inside stair access is not convenient
8. French drain at inlet to water supply for facility has a problem with clogging and there is no good way to clean it
9. French drain providing an inlet to both the potable and non-potable water supply is seen as a risk to the water supply system because the drain is located beneath the pump inlet bays
10. The existing RO system is not functioning well because of membrane fouling due to lack of use
11. The staff drinks bottled water. This results in the potable water system being used only for showers and sink washing
12. Water supply sand filters require high maintenance and the water supply system flow to the filters is reduced during filter backwash cycle

13. The need for softened water was questioned as chemicals for softening are a maintenance issue and expensive
14. Fuel system piping was required to have dual containment by Palm Beach County
15. All gates should be electronically operated
16. Nuisance station shut downs are caused when a ventilation fan has a loss of power or the microwave oven has a problem
17. It was suggested that the control room be located along the opposite wall from the pumps and the pumps/engines be oriented to provide the best view of pump control panels. A sketch illustrating the preferred layout was provided by Operations staff. A drawing of the sketch provided is attached to this memo
18. Intake air lovers need roll filters and the filters take up a lot of space if located inside the pump room

4. RECOMMENDATIONS RESULTING FROM STAFF COMMENTS

4.1 Comments 1, 6, 7 – Maintenance shop

During the design of the new pumping station, consideration should be given to including space for a maintenance shop located either on the pump room level, as in G-310, or on the lower level with inside stair access and possibly overhead crane access adjacent to the stair. This refinement would increase the cost of the station due to the additional interior walls and building electrical and mechanical systems.

4.2 Comments 2, 17 – Control Room location

Consideration should be given to the location of the Control Room and the orientation of the pump/engine units to allow view of the local control panels. After the number of pumping units is determined, layout options should be presented to the Operations staff for discussion and selection of a preferred option. This could be a no additional cost refinement.

4.3 Comment 3 – Inside stair

Space should be provided for stair access from the pump room level to the lower level. Current station layouts require operations staff to exit the building to enter the lower level, or use a ladder though a small manway floor opening. This refinement would be a minor increase to the cost of the station due to additional floor area and the cost of the stairs.

4.4 Comment 4 –Truck access

Consider eliminating the loading dock space and replace it with a continuation of a vehicle access corridor running the length of the pump operating floor. This refinement could provide a reduction in the cost of the station.

4.5 Comment 5 – Helicopter pad

The new pad should be located close enough to the pumping facility to allow visiting dignitaries to walk to the pumping facility. Currently at G370, whenever visitors come to the facility, an appropriate vehicle must be stationed at the site to give rides from the pad and back. This could be a no additional cost refinement.

4.6 Comments 8, 9 – Water supply

A water supply well should be considered for supplying water to the facility in place of the french drain supply system. This will require some study and possibly a test well and ground

water quality analysis to determine the type of treatment required. A backup well or canal inlet may be necessary for redundancy. If a ground water well is not desired, a screened water intake placed in an accessible location should be used for water supply. The cost of this refinement would need to be studied during preliminary design.

4.7 Comments 10, 11 – Potable water

The amount of potable water demand needs to be reviewed prior to selection of a treatment system. Usage data from existing pumping facilities should be reviewed. Bottled water is commonly used for drinking. Shower and kitchen usage is creating the demand for potable water; and this demand maybe infrequent with the design based on a peak need during a storm event when staff is stationed at the facility. A treatment system may be needed that can accommodate long periods of reduced production. The cost of this refinement would need to be studied during preliminary design.

4.8 Comments 12, 13 – Service water treatment

The service water quality requirements should be obtained from suppliers of the anticipated equipment using the service water. These quality requirements should then be matched with appropriate treatment methods based on the raw water supplied to the facility. Attention should be paid to the need for softening. If a sand filter system is used, the system should be designed to provide continuous water even during backwashing of the filters. This could be a no additional cost refinement.

4.9 Comment 14 – Fuel piping containment

The piping design should anticipate Palm Beach County's requirement for spill containment on all fuel and oil piping routed inside the building. This could be a no additional cost refinement.

4.10 Comment 15 – Gate operators

All gates should be provided with a means to operate electrically. This refinement would increase the cost of the station.

4.11 Comment 16 – Nuisance station shut downs

A protocol should be established providing a basis for connecting trouble or emergency signals to control networks that would cause the pumping facility to go into shut down mode. Alarm signals designed to be sent from minor mechanical or electrical systems should have a sensitivity analysis performed on the design before the design is allowed to create an alarm signal that would cause a power interruption to the entire facility. This could be a no additional cost refinement.

4.12 Comment 18 – Intake air filters

The design of ventilation air intake systems should follow the latest District design guidelines that locate roll type inlet air filters outside of the pumping room. This could be a no additional cost refinement.